What is claimed is:

1.   A data forwarding controller for performing data forwarding control via a network, comprising:

a plurality of data input/output ports;

5   means for storing a MAC learning table in which a MAC address of data for forwarding is associated with an output port; and

a control section for updating said MAC learning table, wherein said control section is configured to

10   set, for a mobile node, in said MAC learning table, a plurality of entries associating different output ports with a MAC address of said mobile node, and output data addressed to said MAC address of said mobile node received via said network, to said plurality of output ports in parallel, based

15   on said plurality of entries set in said MAC learning table.

2.   The data forwarding controller according to claim 1, wherein

said control section is configured to

20   set a plurality of entries respectively setting a port to which a current access point of said mobile node is connected and port(s) to which one or more next access points of said mobile node is connected, as output ports corresponding to said MAC address of said mobile node, and

25   output said data addressed to said MAC address of said mobile node received via said network to said plurality of output ports set in said plurality of entries in parallel.

3.   The data forwarding controller according to claim 1,

30   wherein

said control section is configured to

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set an entry in said MAC learning table as an additional entry based on a MAC address of a next access point contained in a handover start message received from said mobile node, wherein said additional entry sets a port to which said next

5 access point is connected, as an output port corresponding to said MAC address of said mobile node, and

output said data addressed to said MAC address of said mobile node received via said network in parallel, to said output ports listed in said plurality of entries as to said

10 MAC address of said mobile node set in said MAC learning table, wherein said output ports are a plurality of ports to which a current access point and said next access point of said mobile node are connected.

15 4. The data forwarding controller according to claim 3, wherein

said control section is configured to

transmit a handover setting completion message to said mobile node from which said handover start message is received,

20 on condition that said setting of said additional entry in said MAC learning table based on said handover start message is completed.

5. The data forwarding controller according to claim 1,

25 wherein

said control section is configured to

delete, based on a MAC address of an old access point contained in a handover end message received from said mobile node, an entry setting a port to which said old access point

30 is connected, as an output port corresponding to said MAC address of said mobile node, from said MAC learning table.

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6.   The data forwarding controller according to claim 1, wherein

said control section is configured to

5   receive data from access points performing data forward to said mobile node, and set another data corresponding to output ports for MAC addresses of said access points, based on said data.

10 7.   A communication terminal apparatus of a mobile type which performs data transmission/reception via a network and which changes access points based on data receiving conditions, wherein

said communication terminal apparatus is configured to

15 acquire a MAC address of a next access point to which said communication terminal apparatus is scheduled to be connected next, and broadcast a handover start message containing said acquired MAC address of said next access point, and

perform a handover process on condition that said

20 communication terminal apparatus receives a handover setting completion message from a data forwarding controller as a response to said handover start message.

8.   The communication terminal apparatus according to

25 claim 7, wherein said communication terminal apparatus is configured to

perform a background scanning process by which all wireless channels are periodically scanned, to acquire and store a source MAC address of a received beacon as said MAC

30 address of said next access point.

9.   The communication terminal apparatus according to
claim 7, wherein said communication terminal apparatus is
configured to

5   re-transmit said handover start message for a time
period from transmission of said handover start message to
reception of said handover setting completion message.

10.   The communication terminal apparatus according to
claim 7, wherein said communication terminal apparatus is
10   configured to

       transmit to said data forwarding controller from which
said handover setting completion message is received or
broadcast, a handover end message containing a MAC address
of an old access point which said communication terminal
15   apparatus has disconnected, after said handover process has
been performed.

11.   A data communication system comprising a communication
terminal apparatus of a mobile type which performs data
20   transmission/reception via a network and which changes access
points based on data receiving conditions, and a data
forwarding controller which performs data forwarding control
via said network, wherein

       said communication terminal apparatus is configured to
25   acquire a MAC address of a next access point to which
said communication terminal apparatus is scheduled to be
connected next, and broadcast a handover start message
containing said MAC address of said acquired next access
point;

30   said data forwarding controller is configured to
         set an entry in a MAC learning table as an additional

entry based on said MAC address of said next access point contained in said handover start message received from said communication terminal apparatus, wherein said entry sets a port to which said next access point is connected, as an output

5 port corresponding to a MAC address of said communication terminal apparatus; and

output data addressed to said MAC address of said communication terminal apparatus received via said network, in parallel to output ports listed in a plurality of entries

10 as to said MAC address of said communication terminal apparatus set in said MAC learning table, wherein said output ports are a plurality of ports to which a current access point and said next access point of said communication terminal apparatus are connected.

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12. The data communication system according to claim 11, wherein said communication terminal apparatus is configured to

perform a handover process on condition that said

20 communication terminal apparatus receives a handover setting completion message from said data forwarding controller as a response to said handover start message.

13. The data communication system according to claim 11,

25 wherein said data forwarding controller is configured to

transmit a handover setting completion message to said communication terminal apparatus from which said handover start message is received, on condition that said setting of said additional entry in said MAC learning table based on said

30 handover start message is completed.

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14.   The data communication system according to claim 11, wherein said data forwarding controller is configured to

delete, based on a MAC address of an old access point contained in a handover end message received from said communication terminal apparatus, an entry setting a port to which said old access point is connected, as an output port corresponding to said MAC address of said communication terminal apparatus, from said MAC learning table.

15.   A method of controlling data forwarding via a network, comprising the steps of:

(a) setting, for a mobile node, in a MAC learning table in which a MAC address of data for forwarding is associated with an output port, a plurality of entries associating different output ports with a MAC address of said mobile node; and

(b) outputting data addressed to said MAC address of said mobile node received via said network, to said plurality of output ports in parallel based on said plurality of entries set in said MAC learning table.

16.   The method according to claim 15, wherein
said step (a) comprises

setting a plurality of entries respectively setting a port to which a current access point of said mobile node is connected and port(s) to which one or more next access points of said mobile node is connected, as output ports corresponding to said MAC address of said mobile node; and
said step (b) comprises

outputting said data addressed to said MAC address of said mobile node received via said network, to said plurality

of output ports set in said plurality of entries in parallel.

17.   The method according to claim 15, wherein
said step (a) comprises
5   setting an entry in said MAC learning table as an
additional entry based on a MAC address of a next access point
contained in a handover start message received from said
mobile node, wherein said additional entry sets a port to
which said next access point is connected, as an output port
10   corresponding to said MAC address of said mobile node; and
said step (b) comprises
outputting said data addressed to said MAC address of
said mobile node received via said network, in parallel to
said output ports listed in said plurality of entries as to
15   said MAC address of said mobile node set in said MAC learning
table, wherein said output ports are a plurality of ports to
which a current access point and said next access point of
said mobile node are connected.

20   18.   The method according to claim 17, further comprising
the step of:
transmitting a handover setting completion message to
said mobile node from which said handover start message is
received, on condition that said setting of said additional
25   entry in said MAC learning table based on said handover start
message is completed.

19.   The method according to claim 15, further comprising
the step of:
30   deleting, based on a MAC address of an old access point
contained in a handover end message received from said mobile

node, an entry setting a port to which said old access point is connected, as an output port corresponding to said MAC address of said mobile node, from said MAC learning table.

5   20. The method according to claim 15, further comprising the step of:

receiving data from access points performing data forwarding to said mobile node, and setting another data corresponding to output ports for MAC addresses of said access
10 points in said MAC learning table, based on said data.

21. A method of performing a handover process on a communication terminal apparatus of a mobile type which performs data transmission/reception via a network and which
15 changes access points based on data receiving conditions,

said method comprising the steps of:

(a) acquiring a MAC address of a next access point to which said communication terminal apparatus is scheduled to be connected next;

20   (b) broadcasting a handover start message containing said acquired MAC address of said next access point; and

(c) performing said handover process on condition that a handover setting completion message is received from a data forwarding controller as a response to said handover start
25 message.

22. The method according to claim 21, wherein

said step (a) comprises

performing a background scanning process by which all
30 wireless channels are periodically scanned, to acquire and store a source MAC address of a received beacon as said MAC

address of said next access point.

23. The method according to claim 21, further comprising
the step of:

5   re-transmitting said handover start message for a time
period from transmission of said handover start message to
reception of said handover setting completion message.

24. The method according to claim 21, further comprising
10 the step of:

transmitting to said data forwarding controller from
which said handover setting completion message is received
or broadcasting, a handover end message containing a MAC
address of an old access point which said communication
15 terminal apparatus has disconnected, after said handover
process has been performed.

25. A data communication method comprising a communication
terminal apparatus of a mobile type which performs data
20 transmission/reception via a network and which changes access
points based on data receiving conditions, and a data
forwarding controller which performs data forwarding control
via said network, wherein

said communication terminal apparatus

25   acquires a MAC address of a next access point to which
said communication terminal apparatus is scheduled to be
connected next, and broadcasts a handover start message
containing said MAC address of said acquired next access
point;

30   said data forwarding controller

sets an entry in a MAC learning table as an additional

entry based on said MAC address of said next access point contained in said handover start message received from said communication terminal apparatus, wherein said additional entry sets a port to which said next access point is connected,
5   as an output port corresponding to a MAC address of said communication terminal apparatus; and

outputs data addressed to said MAC address of said communication terminal apparatus received via said network, in parallel to output ports listed in a plurality of entries
10   as to said MAC address of said communication terminal apparatus set in said MAC learning table, wherein said output ports are a plurality of ports to which a current access point and said next access point of said communication terminal apparatus are connected.
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26.   The data communication method according to claim 25, wherein

said communication terminal apparatus further

performs a handover process on condition that said
20   communication terminal apparatus receives a handover setting completion message from said data forwarding controller as a response to said handover start message.

27.   The data communication method according to claim 25,
25   wherein

said data forwarding controller further

transmits a handover setting completion message to said communication terminal apparatus from which said handover start message is received, on condition that said setting of
30   said additional entry in said MAC learning table based on said handover start message is completed.

28.   The data communication method according to claim 25, wherein

said data forwarding controller further

5   deletes, based on a MAC address of an old access point contained in a handover end message received from said communication terminal apparatus, an entry setting a port to which said old access point is connected, as an output port corresponding to said MAC address of said communication

10   terminal apparatus, from said MAC learning table.

29.   A computer program described for executing a data forwarding controlling process via a network on a computer system, said computer program comprising the steps of:

15   setting, for a mobile node, in a MAC learning table in which a MAC address of data for forwarding is associated with an output port, a plurality of entries associating different output ports with a MAC address of said mobile node; and

outputting data addressed to said MAC address of said

20   mobile node received via said network, to said plurality of output ports in parallel based on said plurality of entries set in said MAC learning table.

30.   A computer program described for executing a handover

25   process on a computer system performed by a communication terminal apparatus of a mobile type which performs data transmission/reception via a network and which changes access points based on data receiving conditions, said computer program comprising the steps of:

30   acquiring a MAC address of a next access point to which said communication terminal apparatus is scheduled to be

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connected next;

broadcasting a handover start message containing said acquired MAC address of said next access point; and

performing said handover process on condition that a
5   handover setting completion message is received from a data forwarding controller as a response to said handover start message.